

Application Serial No. 10/798,001
In reply to Office Action of March 11, 2008

Docket: CU-3633

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Amendments To The AbstractMarked-up Version

The following marked-up version of the amended Abstract is attached hereto to aid the examiner in identifying the changes:

A bio-microarray is presented for [[For]] the purpose of
improving the accuracy of a variety of of analyses ~~using a bio-~~
~~microarray. , it is a main object of the invention to provide a~~ The
bio-microarray is capable of producing a relatively high signal intensity
from a fluorescent molecule and is capable of ~~having~~ exhibiting an
improved quantification performance ~~and to provide a substrate for~~
~~bio-microarray.~~ The bio-microarray can include a substrate, an
anti-reflection layer on the substrate, and an immobilization layer.
The immobilization layer is used to immobilize a probe
biomolecule in a pattern on the anti-reflection layer. The anti-
reflection layer may have a fine uneven structure or may have a
fine porous structure.

~~In order to achieve the object, the invention provides a~~
~~substrate for bio-microarray characterized by having a reflection-~~
~~suppressing function.~~

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REMARKS/ARGUMENTS

Reconsideration is respectfully requested.

Claims 13-21 were pending in the present application before this amendment. By the present amendment, claims 13-15 have been amended. Claims 22-25 have been previously withdrawn. No new matter has been added.

In the office action (page 2), the abstract stands being objected to under MPEP §608.01(b) because it should be limited to a single paragraph and it should be clear and precise.

The applicant has subsequently amended the abstract and subsequently believes that the basis for this objection to the abstract has been removed. Accordingly, the examiner is respectfully requested to withdraw this objection to the abstract.

In the office action (page 4), claims 13-21 stand rejected under 35 U.S.C. §112 ¶ 2 as being indefinite.

The applicant has subsequently amended independent claims 13-15 to include the transitional phrase "comprises" and subsequently believes that the basis for this rejection to the claims has been removed. Accordingly, the examiner is respectfully requested to withdraw this rejection to the claim 13-21.

In the office action, claims 13-15 and 19-21 stand rejected under 35 U.S.C. 102(b) as being anticipated by WO 00/61282 (Giaever) and as evidenced by U.S. Patent 5,583,840 (Minemura). The "et al." suffix is omitted in a reference name.

The applicant respectfully disagrees and believes that the claims, as they now stand, are in condition for allowance.

Based on the disclosure of Glazier wherein a layer comprising silica particles is formed on a plastic substrate, the examiner suggests that Glazier discloses the invention having substantially the same technical structure as that of the substrate for bio-microarray recited in the present application except that the bulk refractive index of the fine particle used in the anti-reflection layer is smaller than the refractive index of the substrate. The examiner further states that Glazier discloses an example where a refractive index of the anti-reflection layer is smaller than that of the substrate because the present application describes the refractive index of Silica as 1.46, and Minemura discloses the refractive index of plastic as about 1.5.

Further to the above statement made by the examiner, the applicant has

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closely examined Minemura and has come to conclude that Minemura also does not disclose such a description that the refractive index of plastic is about 1.5.

What Minemura discloses is that the refractive indices of materials such as SiO and SiO₂ is about 1.5 which is almost the same refractive indices as a transparent substrate conventionally and commonly used (see Minemura col. 7, lines 46-54), and the refractive index of 1.5 is used for calculation when such a transparent substrate is used (see Minemura at col. 8, lines 25-27).

Accordingly, Minemura merely discloses that the refractive indices of a transparent substrate and materials such as SiO and SiO₂ is almost the same as about 1.5. Further, glass and plastic are listed as materials for the transparent substrate (see Minemura at col. 6, lines 56-57) and therefore, the transparent substrate is not necessarily a plastic.

In view of the above, the applicant respectfully believes that the examiner has misinterpreted the Minemura disclosure.

The applicants respectfully disagree that the porous region comprising colloidal silica particles can somehow be equated to an anti-reflection layer. Specifically, as taught by Glazier, one advantage of the porous region is that it has higher surface area. Glazier goes in great detail in describing the porous region which includes pore sizes, porosity, and porous surface thickness. Further the porosity may be "open" or "closed" wherein "closed" being that condition that not all of the pores need to connect to another pore. Glazier is silent with regards to a porous region also being an anti-reflection layer. Therefore, the applicant believe that Glazier does not teach or suggest an anti-reflection layer.

The applicant respectfully disagrees that the linker molecules can somehow be equated to an immobilization layer. Specifically, as taught by Glazier the linking molecules simply contribute to the net hydrophobic or hydrophilic nature of the surface (See Glazier p. 26 lines 24-26). The applicants believe that changing the net hydrophobic or hydrophilic nature of a surface constitutes a surfactant and not an immobilization layer. Therefore the linking molecule taught by Glazier does not teach or even suggest an immobilization layer.

It is well settled that a reference(s) must teach each and every claimed limitation to anticipate a claimed invention.

Since Glazier as evidenced by Minemura do not teach or suggest the claimed

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anti-reflection layer, then for this reason alone, Glazier as evidenced by Minemura cannot support an anticipation rejection to claims 13-15 and 19-21. Since Glazier as evidenced by Minemura do not teach or suggest the claimed immunization layer, then for this reason alone, Glazier as evidenced by Minemura cannot support an anticipation rejection to claims 13-15 and 19-21. Further since Glazier as evidenced by Minemura do not teach or suggest the claimed limitation that the refractive index of the anti-reflection layer is smaller than that of the substrate, then Glazier as evidenced by Minemura cannot support an anticipation rejection to claims 13-15 and 19-21.

Accordingly, the applicants believe that these claims are in condition for allowance and respectfully requests that the examiner withdraw this anticipation rejection to claims 13-15 and 19-21.

In the office action (page 7), claims 16-18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over WO 00/61282 (Giaever) and as evidenced by U.S. Patent 5,583,840 (Minemura) and further in view of Noblett (U.S. 6,362,004).

The applicant respectfully disagrees and submits that the claims, as they now stand, are in allowable form.

The above comments are equally applicable here in that Giaever and Minemura, in whole or in combination, do not teach or suggest the claimed immobilization layer, the claimed anti-reflection layer and the claimed limitation that the refractive index of the anti-reflection layer is smaller than that of the substrate.

Regarding Noblett, the Examiner uses Norblet to teach using fiducial marks located in predetermined locations with respect to a microarray sample to position and align the sample with greater precision for detection purposes. The applicant finds that Noblett at most teaches a planar substrate having a sample surface in which target and fiduciary spots are disposed. Noblett is silent in teaching or suggesting the claimed immobilization layer. Further Noblett is also silent in teaching or suggesting the claimed anti-reflection layer. Finally Noblett is also silent in teaching or suggesting the claimed limitation that the refractive index of the anti-reflection layer is smaller than that of the substrate.

It is well settled that the combined prior art reference(s) must teach each and every claimed limitation to render an invention obvious. Since Giaever, Minemura, and Noblett, in whole or in combination, do not teach or suggest all of the claimed

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limitations of the present application, then since Giaever, Minemura, and Noblett cannot support a obviousness rejection to claims 16-18. In particular, Giaever, Minemura, and Noblett, in whole or in combination, do not teach or suggest the claimed immobilization layer. Further, Giaever, Minemura, and Noblett, in whole or in combination, also do not teach or suggest the claimed anti-reflection layer. Finally, Giaever, Minemura, and Noblett, in whole or in combination, do not teach or suggest the claimed limitation that the refractive index of the anti-reflection layer is smaller than that of the substrate.

Therefore the applicant believes that claims 16-18 are in condition for allowance and respectfully requests that the examiner withdraw this obviousness rejection to claims 16-18.


For the reasons set forth above, the applicant respectfully submits that claims 13-21, now pending in this application, are in condition for allowance over the cited references. Accordingly, the applicant respectfully requests reconsideration and withdrawal of the outstanding objections and rejections and earnestly solicits an indication of allowable subject matter.

This amendment is considered to be responsive to all points raised in the office action. Should the examiner have any remaining questions or concerns, the examiner is encouraged to contact the undersigned attorney by telephone to expeditiously resolve such concerns.

Respectfully submitted,

JULY 11, 2007

Date


Loren K. Thompson, Ph.D., Reg. No. 45918
c/o Ladas & Parry LLP
224 South Michigan Avenue
Chicago, Illinois 60604
(312) 427-1300